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November 23, 2004

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Via Federal Express

Re: Search for Petition to Make Special
US Pat. App. No. 10/820,858
Your Ref: 340301180US01
Our Ref: H-0411-027

Mr. Noboru Otsuka
Senior Patent Engineer
Intellectual Property Group
Patent Department V
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Dear Mr. Otsuka:

In accordance with your request of November 9, 2004, we have conducted a pre-examination prior art search in compliance with the requirements of MPEP 708.02 VIII (C) for filing a Petition to Make Special in the above-referenced patent application.

Subject Searched

The search was directed to the invention set forth in claims 1-11 in the above-referenced application. Specifically, claims 1-11 are directed to a computer system having a first site with a first computer and a first storage apparatus, and a second site with a second computer and a second storage apparatus. A network connects the first site, the second site, and a management computer to one another. The system sets priorities for data such that the first storage apparatus subjects data stored in the first storage apparatus to grouping on the basis of information inputted to the management computer. The first storage apparatus transfers updated data in a group by a unit of the group, to the secondary storage apparatus. If the first site is stopped, the second site recovers data by a unit of the group.

Under additional aspects, the first storage apparatus performs the grouping by giving priorities to the data on the basis of a recovery time required in recovering the data in the

second site. The second site recovers data included in the groups obtained by the grouping in an order of priorities of the required recovery time. Additionally, the data transfer by a unit of the group from the first storage apparatus to the second storage apparatus may be performed in asynchronous remote copy. Also, log data to be used in a database is included in the data subjected to the grouping, and the data of a group, in which the log data is included, is transferred from the first storage apparatus to the second storage apparatus in synchronous remote copy. A higher priority of recovery time is allocated to the group in which the log data is included.

Field of Search

We conducted our initial search using the US Patent Office's Examiner Application Search Tool (EAST) database and image retrieval system. The EAST database contains images of all issued US patents and published US patent applications searchable by subclass or document number. The EAST database also includes: the searchable full text of US patents issued since 1971; the searchable full text of all US published patent applications; and the searchable abstracts of a large number of patents and patent applications from the European and Japanese Patent Offices. We used keyword searching and forward/backward cross-referencing to locate relevant art, and we also searched, in particular, in the following *US Manual of Classification* subclasses:

<u>Class</u>	<u>Subclass</u>
707	202, 204
709	217
711	161, 162
714	4, 6

Because of the large sizes of these subclasses, we used keywords to narrow the number of documents returned. We also conducted a search for foreign art using the European Patent Office's ESPACENET database and Japanese patent database.

Please note that although we use our best efforts to attempt to locate all relevant prior art when conducting a search, patent searching is an inexact discipline. Due to imprecision in the USPTO's methods of classifying patents, and vagaries in the system of patent drafting in general, we can never guarantee that all relevant art has been located. Thus, there is always some possibility that other relevant patents may exist in addition to those listed herein. Should you desire that we conduct additional searching on this subject, please let us know.

Prior Art Located

Patents and/or published patent applications located by our search that are believed to be of interest are enclosed as follows:

<u>Document No.</u>	<u>Inventor</u>
US 5659614	Bailey, III; John E
US 5966730	Zulch, Richard C
US 6553401	Carter, Edward D. et al.
US 6601187	Sicola, Stephen J. et al.
US 20030069889	Ofek, Yuval
*US 20030115433	Kodama, Shoji
US 20030177324	Timpanaro-Perrotta, Michael C.
US 20040128363	Yamagami, Kenji

*Indicates Hitachi patent or published application

Discussion

As instructed, we have included below a discussion of each of these references explaining what each of the references teaches, and explaining why the claimed invention is not anticipated by the reference, or is otherwise distinguished from the reference.

The patent to Bailey, US 5659614, shows a method and system for creating and storing a backup copy of file data stored on a computer. The system prioritizes the files to be transmitted to the backup site. The files are prioritized according to ratings based on predetermined criteria. Higher rated files are transmitted to the backup site prior to lower rated files. Subsequently, data blocks within each file are examined to determine if they are identical to prior data blocks transmitted to the backup site during a previous backup operation. Identical data blocks are replaced by a token that is then transmitted to the backup site. The files that are to be transmitted to the backup site are encoded. All instances of predetermined client-specific data elements within each file are identified. Each identified data element is replaced by a corresponding code prior to encryption. (See Abstract, figures 1-13, column 3, column 5 lines 55-67 and column 10 lines 30-67.) Thus, Bailey does not teach the use of a dedicated computer for management of the primary storage and remote storage unit. Also, Bailey does not teach the use of the remote copy system for recovery of data as a unit of group from second site in case of first site failure.

The patent to Zulch, US 5966730, shows a backup system for a computer network incorporating opportunistic backup by prioritizing least recently backed up computer or computer storage medium. The backup system is operated in accordance with a backup server containing an administrator-written script, backup protocol, or program. In operation, when backup is initiated, the total number of client computers having accessible data sources and the total number of storage media destinations are generated in a "trigger list." Utilizing the script, the trigger list is prioritized with the least-recently-backed-up client computer, as dated by the last backup time using this script, having first priority for backup. Once prioritization has occurred, backup is initiated in the order of prioritization to the first available of the client computers to storage media paths. Once a client computer is backed up, it is ineligible for further backup until the script's backup interval elapses. (See Abstract,

figures 1-6, column 33 lines 55-67 and column 4.) Thus, Zulch does not teach the use of a remote copy system for recovery of data by a unit of a group from a second site in the case of a first site failure.

The patent to Carter, US 6553401, shows a system for implementing a high volume availability server cluster including both sharing volume of a mass storage on a local site and mirroring a shared volume on a remote site. The computer readable medium includes instructions which, when executed, cause a cluster manager to allocate the service and at least one shared volume of a first mass storage device associated with the service to a first server of a first subcluster located at a first site and comprising a plurality of servers that share the first mass storage device. The computer readable medium also includes instructions, which when executed, cause the cluster manager to mirror the at least one shared volume to a second mass storage device of a second subcluster located at a second site and comprising at least one server in order to obtain a first mirrored copy of the at least one shared volume at the second site. (See Abstract, figures 1-2, column 2 lines 15-67 and column 3 lines 1-35.) However, Carter does not teach the grouping of the data to be backed up and the use of a dedicated management computer for copying data from a first site to a second site.

The patent to Sicola, US 6601187, shows a system for data replication using redundant pairs of storage controllers, fiber channel fabrics, and links therebetween. A system for remote backup of data written by a host computer to a first array of mass storage devices includes a first site with components including the host computer. Also included are a first array controller and a second array controller, operatively coupled to the first array of mass storage devices. A second site has components including a third array controller and a fourth array controller, operatively coupled to a second array of mass storage devices. A first switched fabric is also included in the system and comprises a first switch interconnecting the components of said first site, a second switch interconnecting the components of said second site, and a first fiber channel link connecting the first switch and the second switch. Each array controller in the system is capable of performing all of the data replication functions, and each host "sees" remote data as if it were local. (See Abstract, figure 1-9, column 4 and column 5 lines 1-30.) Thus, Sicola does not teach the grouping of the data to be backed up or the use of a dedicated management computer for copying data from a first site to a second site.

The published US patent application to Ofek, US 20030069889, shows a data processing system that includes redundant storage of data, and that enables access to the data by multiple processes. A first data processing system with a first data facility stores a data base and processes transactions or other priority applications. A second data storage facility, that may be physically separated from the first data storage facility, mirrors the data in the first data storage facility. In a concurrent access operating mode, the second data storage facility makes the data available to an application concurrently with, but independently of, the operation of the other application. On completion of the concurrent operation, the second data storage facility can reconnect with and synchronize with the first data storage facility thereby to reestablish the mirroring operation. (See Abstract, figures 1-22, paragraphs

[0022]-[0025] and [0085].) However, Ofek does not teach the use of a dedicated computer for management of the primary storage and remote storage unit for copying the data using the network connection between them.

The published US patent application to Kodama, US 20030115433, shows a method of performing a remote copy transfer of data from a local storage facility to a geographically remote storage facility on a prioritized basis. Data is assigned a priority at the local storage facility based upon the importance of that data. Some data will have a high priority, other data a lower priority. Data is transferred according to the assigned priorities. Changes to the data, prompted by write requests received by the local storage facility, will initiate a remote copy operation that results in a transmission of the changed data to the remote storage facility. A remote copy request, identifying the data to be transferred, and the corresponding pair of storage areas affected, is created and queued. Periodically, the queue is reviewed, and those remote copy requests associated with storage areas with an assigned higher priority are transmitted first, followed by data written to a storage areas assigned a lower priority. (See Abstract, figures 1-17, and paragraphs [0006]-[0010], [0038], [0041], [0060], [0063] and [0071]-[0074].) Thus, Kodama does not teach the use of a dedicated computer for management of the primary storage and remote storage units for copying the data using the network connection between them.

The published US patent application to Timpanaro, US 20030177324, shows a method, system, and program for maintaining backup copies of files in a backup storage device. The files in the primary storage device are capable of being restored from the backup copy of the files in the backup storage device. An association of one of a plurality of priority values is maintained for each file in the backup copy in the backup storage device. The priority value associated with each file in the backup copy of the files is used to determine the order in which the files in the primary storage device are written to the backup copy in the backup storage device. In the system, the priority value for files to backup in a backup storage device may be used to optimize the manner in which data is restored and reduce the time during which data is unavailable for use during a restore operation from the backup storage device. (See Abstract, figures 1-5, and paragraphs [0008]-[0013], [0023]-[0031] and [0034]-[0038].) However, Timpanaro does not teach the use of a network connecting the primary and the secondary sites for data backup, or the use of a computer for managing data from one to one another.

The published US patent application to Yamagami, US 20040128363, shows a system for remote copy with path selection and prioritization. The system provides a method for handling a remote copy request in a distributed storage system. The system provides a plurality of primary volumes within a primary storage system that is coupled to a primary host via a first network. The primary storage system is coupled to a secondary storage system via a second network. A first request is selected from a plurality of requests placed in a queue based on priority information associated with the requests. A first path group is selected from one or more path groups that could be used to transmit the request. The first request is transmitted to the secondary storage system using the first path group, with the

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secondary storage system including a plurality of secondary volumes that are paired to the plurality of primary volumes. (See Abstract, figures 1-19, paragraphs [0014]-[0017] and [0106]-[0109].) Thus, Yamagami does not teach the use of the remote copy system for recovery of data by a unit of a group from a second site in the case of first site failure.

Conclusion

As you requested, two CD-R's are enclosed containing electronic copies of the references located and this report. Our invoice is enclosed for services and disbursements expended in conducting the search. Should you have any questions regarding the search or its results, please let us know.

Best regards,

Mattingly, Stanger & Malur, P.C.

By:

Colin D. Barnitz

Enclosures